

REMARKS

Claims 1-13 are pending in the application. Claims 8-13 are rejected. Claims 1-7 stand withdrawn from consideration on the basis of an election without traverse by the Applicant. Applicant has canceled claims 1-8 without prejudice or disclaimer and has amended claims 9, 12 and 13. New claims 14-17 have been added.

Claim Rejections - 35 U.S.C. §102

Claims 8, 12 and 13 are rejected under 35 U.S.C. §102(b) as being anticipated by the European Patent Application to Pedersen (EP-0767116-A2). As a preliminary matter, Applicant notes that the Examiner has omitted claim 12 from his statement of the rejection. However, it appears from the Examiner's detailed remarks, the Examiner intended to include claim 12 in the rejection. Accordingly, claim 12 has been treated as a rejected claim. The rejection of claims 8, 12 and 13 is traversed on the basis of the Applicant's amendments and arguments.

The Claimed Invention

Elected claims 8-13 are directed to a method of producing a disc cable which travels within an endless piping. The combination of pipe and disc cable is used for transporting animal feed or the like to livestock. The method comprises three distinct embodiments as illustrated in Figs. 2A and 2B, Fig. 3 and Fig. 4, respectively. In this regard, claim 8 is directed generally to the concept of molding a disc 3 onto a resin-covered metal wire 2, as illustrated in Fig. 1. Claim 9 is directed to the embodiment of Figures 2A and 2B where the metal wire 4 has a synthetic resin cover layer 5 that is formed on the wire surface and has a groove-like part 6 through which the surface of the metal wire is exposed. The disc 3 is formed of synthetic resin, which flows into the groove 6, forming a protrusion 8 on the resin disc 3 and fixedly mounting the disc to the resin cover layer 5 on wire 4. Notably, the length of the groove is in the range of 1.0-5.0 mm. Also, the disc has a radial part that extends radially from the longitudinal axis of the wire and has a boss part that extends along the longitudinal axis of the wire. Claims 10 and 11 concern a wire 4 having a cover layer 35 that is integrally formed with a disc 33 at predetermined lengths along the wire 4. Successive sections of the disc and cover combination are formed such that the disc has a fitting hole 34 into which the cover layer 35 of a preceding disc is disposed. The third embodiment is covered by claims 12 and 13 and concerns a disc 56 that is first formed on wire 4

with a radial part and a boss part that comprises a boss 54 together with a depression 57. After the disc is formed, a cover layer 55 is formed over the boss and fills the depression 57 forming a protrusion 58 that ensures a secure fit.

The Prior Art

The reference to Pedersen concerns a conveyor cable formed of a steel wire 1 and having discs 2 formed on its surface for use in conduits that transport food to livestock. The discs 2 are molded as a relatively stiff and rigid elastomer directly onto the steel cable, but have short thin outwardly extending sockets 2a at opposite sides of the discs. A bendable elastic coating layer 3, preferably a thermoplastic elastomer, is formed over the sockets and between adjacent discs 2 in order to provide a sealed and tightly connected conveyor cable. As explained at column 3, lines 38-45, the sockets 2a are provided with radially extending annular protrusions 2b that secure a good fix of the ends of these protrusions and the wire coating 3. Rims 3a of the wire coating 3 can be provided to cooperate with the protrusions 2b of the sockets 2a.

The rejection of claim 8 is moot in view of the cancellation of the claim without prejudice or disclaimer.

With regard to claim 12, the Examiner asserts that Pedersen first forms the discs 2 that include sockets (flange or boss parts) on the cable, followed by the forming of the cable coating between the discs and also over the sockets, as shown in Fig. 1. As to claim 13, the Examiner asserts that the socket part of the disc (flight) has protrusions and that in between the protrusions are depressions in the sockets, while the wire coating has corresponding depressions and protrusions. The Examiner asserts that, consequently, the fit of protrusions and depressions provide a secure fixation of the ends of the socket and the wire coating.

In distinguishing the invention of claims 12 and 13 from the teachings of Pedersen, particular attention must be paid to the precise placement of the depression 57 and the protrusion 58, adjacent to the radially extended disc 53. In order to better define that placement, Applicant has amended the claims by focusing on the definition of the disc with a radial part having opposed radial surfaces, and a coating extending along the longitudinal wire axis to a radial surface of a disc. This amendment would distinguish Pedersen structurally. Moreover, the claimed invention is advantageous because the relationship between the disc 56 and cover layer

55 provides a tight coupling between the cover layer 55 and the disc structure 56. This structure has the advantage of avoiding the need for wire rims 3a, and providing a better interface. In Pedersen, there is a disadvantage because Pedersen's coating layer 3 does not extend up to the radially extended wall of the disc 2 and the depression 2a is not formed directly adjacent to the wall of the disc.

Claim Rejections - 35 U.S.C. § 103

Claims 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pedersen (EP-0767116-A2) in view of Henfrey et al (3,992,503). This rejection is traversed.

The Examiner asserts with regard to claims 10 and 11 that Pedersen teaches the manufacturer of discs (flights) and cable coatings of the same material in an injection molding process. The Examiner admits that Pedersen teaches away from the use of a single material. Nonetheless, according to the Examiner, Pedersen shows that the solution of a single integrated structure is known by virtue of Pedersen's criticism of such structure. The Examiner admits that Pedersen does not specifically teach how such solution may be carried out.

Because of these deficiencies in Pedersen, the Examiner looks to Henfrey et al for a teaching of the method of injection molding pipe, having outer ridges against an inner molded part, as illustrated in Fig. 2, in successive segments. The Examiner asserts that it would have been obvious to modify the disc cable process of Pedersen on the basis of the pipe process of Henfrey et al in order to form an indefinite length disc cable by injection molding, for the purpose of reducing the number of molding steps. The Examiner also asserts that the use of ridges, stepped diameter structures and fitting holes as taught by Henfrey et al would be desirable in the disc cable of Pederson, these additions being motivated by a desire to produce a better connection between sequentially molded parts of a conduit scraping conveyor. The Examiner further asserts that the simple substitution of a core mold part of Henfrey et al for a cable of Pedersen would have been obvious because a cable constitutes the same cross sectional shape as the core member of Henfrey et al.

The Examiner goes far beyond the proper combination of references in formulating this rejection. The Examiner clearly is using hindsight to combine the two references from clearly different fields. First, the pipe forming process in the Henfrey et al reference does not even have

a remote connection to the present invention. Molding a cover and conveying structure onto a flexible wire has no relation to making pipe. Second, as admitted by the Examiner, Pedersen teaches away from the present claimed invention. Third, even if the two references are combined, nothing in Pedersen or in Henfrey et al even remotely suggests the sectional integrated molding process of Figure 3, as set forth in claims 10 and 11.

As explained at page 7, lines 3-10, and page 9, line 28 to page 11, line 10n of the specification, the present invention is a process of conveniently making a disc cable by molding the disc structure in combination with a coated cable in sections using an injection molded process. This process comprises the production of an integrally formed section of predetermined length over a wire core, the sections being coupled together in chain-like form to form a disc cable. Clearly, this process allows the wire 4 to serve as a convenient guide for an infinite length production process, and permits a disc cable 31 to be produced simply and quickly. Further, the sections are tightly fitted together with this process and the disc cable can be rolled, bent or otherwise conveniently stored. None of these advantages appear in Pedersen taken alone or in combination with Henfrey et al. Accordingly, the rejected claims should be considered patentable over the references. Applicant submits that the Examiner has not met the standard for shifting the burden of proof onto the Applicant. The Examiner's own admissions and the deficient teachings in the two prior art references can only lead to the conclusion that the claimed invention is not obvious.

Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pedersen (EP-0767116-A2) in view of Japanese Patent to Yamamoto et al (JP-62103118-A). This rejection is traversed.

The Examiner admits that Pedersen does not teach the injection molding of the cable cover followed by the molding of the flight or disc. The Examiner admits that Pedersen teaches just the opposite steps. However, the Examiner asserts that Pedersen does not teach that the claimed order could NOT be performed. Moreover, the Examiner asserts, that Pedersen suggests that contact between the disc structure and wire are necessary since Pedersen criticizes the prior art where there is a direct contact between a coated wire and a disc that is injection molded directly onto a cable. The Examiner makes several unsupported allegations of the knowledge of one skilled in the art with regard to cables and their coatings, specifically a knowledge to cut out

portions of a coating and a knowledge to reverse the order of steps in Pedersen in order to increase the speed of processing a cable and to improve the connection of the flight to the cable.

The Examiner's position is wholly unreasonable. First, Pedersen teaches away from the claimed invention, as is clearly acknowledged by the Examiner. The Examiner's attempt to use Pederson's silence as to an opposite series of steps to bootstrap an assertion that the claimed order would be obvious is the clearest form of impermissible hindsight. Moreover, the Examiner's allegations of knowledge in the art without supporting documentation is improper under U.S. law.

Yamamoto does not help cure the deficiencies in Pedersen as it merely teaches deforming a plastic wire 1 to form grooves or protrusions and then forming a flange by molding over the protrusions or grooves. Thus, Pedersen, with or without the teachings of Yamamoto, would have formed the cable coating first, followed by the molding of the discs of flight segments. As already discussed, the specific approach by Pedersen is to provide a coupling between the coating 3 on a wire and the discs 2 having a groove that is filled by the coating 3 and then sealed with a ring 3a. Pedersen clearly failed to understand the advantage of forming the disc after a coating has been applied to the wire. Pedersen's concern may have been with the stability with which the disc would adhere to a coated wire. Pedersen clearly wishes to have his disc firmly attached directly to the wire and not to overlie a coating. In contrast, the present invention has a groove 6 that is only at a small portion of the disc structure 3, thereby permitting a major portion of the disc to be molded over the coating itself. Nothing in Pedersen nor in Yamamoto would lead to this approach.

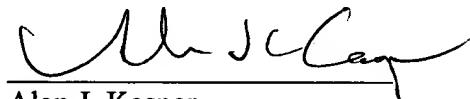
Accordingly, Applicant submits that original claim 9 is patentable. However, Applicant has added additional claims that are directed to the size of the grooved part 6 and to the particular shape of the disc with a boss structure.

On the basis of the foregoing, Applicant has canceled claims 1-7, as they are non-elected. Applicant also has canceled claim 8 and amend claims 12 and 13 in order to further distinguish them from the prior art. Further, Applicant respectfully submits that claims 9-11 are patentable over the prior art as originally filed. Applicant has made a minor amendment to claim 9 to provide additional clarity, and has added new claims 14-17, as being dependent upon claim 9.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1-8 are canceled.

The claims are amended as follows:

9. (Amended) A producing method for a disc cable which travels within piping connected endlessly, the cable having discs disposed thereon in a predetermined spacing relation, the method comprising:

a step of forming a cover layer formed of synthetic resin on the surface of a metal wire, and forming a groove-like part [to] through which the surface of [a] the metal wire is exposed, said groove-like part not forming a part of the cover layer and being distributed in a predetermined spacing relation in a longitudinal direction of a cable, and

a step of molding a disc formed of synthetic resin, and causing synthetic resin to flow into the groove-like part to form a protrusion on the disc to fixedly mount it on the cable.

12. (Amended) A producing method for a disc cable which travels within piping connected endlessly, the cable having discs disposed thereon in a predetermined spacing relation, the method comprising:

a step of forming a disc [formed] of synthetic resin on the surface of a metal wire, said wire having a longitudinal dimension, to fixedly mount it on the metal wire, said disc having a radial part with opposed radial surfaces that extend orthogonal to said longitudinal dimension of said wire and boss parts, each boss part extending from a respective radial surface of said disc, and

a step of forming a cover layer formed of synthetic resin on the surface of the metal wire and extending to a radial surface of said disc and covering at one end thereof [on] a boss part of the disc.

13. (Amended) A producing method for a disc cable which travels within piping connected endlessly, the cable having a metal wire core and discs disposed thereon in a predetermined spacing relation, each of said discs comprising a radially extending part having

opposed radial surfaces and a boss part extending from a respective one of said radial surfaces and having an inner layer part and a flange part, the method comprising:

[a step of] molding [an] the inner layer part of the boss part of the disc and [a] the flange part integrally, and forming a depression in the inner layer part of the boss part of the disc proximate a radial surface of said radially extending part, and

[a step of] forming the cover layer formed of synthetic resin on the surface of the metal wire, covering one end thereof on the inner layer part of [the] a boss part of the disc to form an outer layer of the boss part extending to said radial surface, and forming a protrusion corresponding to the depression on one end of the cover layer.

Claims 14-17 are added as new claims.